National Assessments on Gender and Science, Technology and Innovation (STI)

Scorecard on Gender Equality in the Knowledge Society

Overall Results, Phase One September 2012



Overall Results



The **European Union** as a composite ranks first overall, and first or second in every dimension except opportunity and capability. This is a remarkable result, considering the wide variation among countries in the EU in terms of social support, GDP, and promotion of STI.

The **United States** ranks second overall, but 5th in health, agency, social status. Its high status overall comes from its primary ranking in the opportunity and capability and the knowledge society decision-making dimensions – educational levels of women and positions in private sector and science decision-making levels. It comes in second in economic status and access to resources. The US ranks lowest in enabling policies. While it ranks higher in other sectors, this finding indicates that a more favourable policy environment for the US could be an important strategy towards addressing economic competitors in other parts of the world and a strategy for regenerating economic growth after the economic crisis of 2010.

Brazil ranks the highest of the remaining countries, coming in above even the Republic of Korea. It is third overall, first in women's participation in the knowledge economy and science, technology and innovation, as well as agency. It is second in health, opportunity and capability and enabling policy, and third in social status, economic status and access to resources. However its low ranking (4th) in knowledge society decision-making show where improvement needs to be made in addition to those areas where it ranks third. Brazil is an example of a country with both a highly enabling policy environment for women and effective implementation strategies.

Although **Indonesia** comes out fourth overall, its actual status is not clear as a result of a paucity of available statistics on the situation of women. Of the countries in this study, Indonesia collects the least sexdisaggregated data, with data unavailable for many of the indicators. Its positive enabling policy environment, though, gives it a strong potential for a positive outcome for women that would be clearer if supporting data were available. The available data gives it a fourth ranking in most sectors, which reflect a steady improvement over the last decade1, however current levels of economic status, access to resources, agency, health and social status indicate a need to improve the actual status of women in the country.

South Africa ranks fifth overall but first in agency. It ranks highly also in knowledge society decision-making (2), third in social status, and fourth (although close to the higher ranked countries) in science, technology and innovation participation. This is likely a result of a strong educational system, a policy focus on STI, as

¹ Lack of data for many indicators means that Indonesia's ranking may change as more data and expert analysis are incorporated into the national assessment.

well as a quota system implemented in various sectors of society to promote diversity of participation by race and gender. Its high rate of HIV in the population puts it last in health, while it ranks fifth in access to resources.

Republic of Korea – While it ranks first in health it is last several sectors, including economic status, access to resources, enabling policy, knowledge economy and STI participation. It ranks second to last (sixth) overall. This reflects the situation that even though it ranks third in opportunity and capability it sees a low level of female participation in public and economic life in both public and private sectors. This shows the country has failed to adequately support its women to participate actively in its economic success. It also shows the lack of correlation between a country's GDP and gender equality.

India ranks the lowest overall and in most categories, except in economic status; knowledge economy, enabling policy; and health. While its enabling policy environment is very positive and has been in place for many years, implementation and funding needs to increase substantially before its women can equally benefit from its innovation advantage. There are definite signs of progress, though. It has achieved universal primary education enrollment for example. However, size of the population mitigates against a rate of change as rapid as a country such as Indonesia or Brazil.

Scorecard on Gender Equality in the Knowledge Society



As expected, women live longer than men in all the countries covered. The prevalence of HIV/AIDS leaves both South African males and females with the lowest rates of life expectancy. Korean women are the longest living of any group surveyed—three full decades more than women in South Africa. Women live nearly 10% or more longer than men in the EU (11.3%), Brazil (10.8%) and South Korea (9%).







Healthy life expectancy is the average number of years that a person can expect to live in "full health", that is, excluding the years affected by disease and/or injury. HLE numbers are lower by 10-20 years. Differences between women and men are smaller, less than a year in South Africa up to six years in South Korea. South Korean woman are also the healthiest overall.



As the statistic measures the prevalence of HIV/AIDS in all adult women, the figure is not high for most countries, except South Africa where it is an alarming 19.7%. Nevertheless, even though in India the figures are below the point of concern of <0.1%, they are significant (though falling) because of the size of the affected population – nearly one million women.



Lower infection rates among young women in South Africa (13.6% vs 19.7% for adult women) indicate progress is being made in educating the young about the dangers of HIV/AIDS transmission. In the EU and Brazil, rates are higher among young women than among adult women, indicating a need for more education among young people. Indonesia, the Republic of Korea, and the US do not collect data on this indicator, which might alert health authorities to a potential at risk-target group.



This is an important indicator in targeting at-risk groups. Females range from about one guarter (US) to one third (Indonesia), to 2/5 (Brazil and EU) of new infections. In Brazil, although in absolute numbers men are affected most, infection rates are increasing more rapidly among women. Rates for females in Indonesia have doubled over the decade, with a slight fall in the US. Data are not available for the other countries surveyed - notably South Africa.



Falling fertility rates correlate with increased female education and labor force participation as well as improved health. Only in India, Indonesia and South Africa are fertility rates above population replacement level. Notably, rates are falling in these three countries and do not exceed 2.6 (with India the highest) in any.



figures roughly half or less that of lifetime physical violence. Korea and Brazil are highest at 12-13%, followed by India and the US.

Children and youth domestic chores (hours)



While sex-disaggregated data are scarce – only Brazil and India collect it at the national level – this important indicator shows that in those countries reporting data, girls are expected to contribute greater amounts of time to domestic chore than boys: in Brazil, 1.8 vs 1.1 hours per day, and in India, 1.6 vs 1.2.

3. **Economic Status** Labour force participation Economic status: Labour force participation 70 E 60 50 40 os 2002 2003 Timeframe = India Female adults % 🔹 India Male adults % 🔺 European Union Female adults % • European Union Male adults % United States Female adults % Vinited States Male adults % Republic of Korea Male adults % lic of Korea Female adults % Brazil Female adults 9 Brazil Male adults % = South Africa Female adults % • South Africa Male adults % Indonesia Female adults % 🐤 Indonesia Male adults %

India has the lowest female-to-male labour force participation ratio at 35.9%, with substantial drops in this ratio over the decade (5% for India, 7% for Indonesia). This may be the result of more women returning to school, higher unemployment among women or more women dropping out of the labour force. The US (83.3%) and EU (82%) show the highest ratio of women to men in the labor force and the biggest gains over the decade. This may indicate that women's employment suffered less from the recent economic crisis. The ratio for Korea was quite high at 67.8% (although low by standards of high income countries). Women's labourforce participation rate is falling in India, South Africa and Indonesia, while in the EU it is growing fast and in Korea, Brazil and the US is comparatively stable. Overall rates for women alone are lowest, again, in India (29%) and highest (at the same level) in Brazil and the US (60%).



India sees by far the highest percentage of both men and women in agriculture than any other country, with substantially more women working in this sector - 65% compared to 42% for men. Figures for both men and women are falling, though, reflecting global trends. In Indonesia, agriculture remains a dominant employment sector, with numbers in the 40% range for both men and women. As a high-income industrialized country, 7% of both men and women in Korea work in agriculture, a drop of nearly 50% for women over the decade. Brazil shows a relatively high percentage of both men and women (about 16% overall). South Africa's figures were surprisingly low for both men and women, showing the remnants of apartheid and the effects of labour migration. The overall percentage of men and women is small (3.8% and 5.6% respectively) and falling rapidly. The US and EU show the lowest percentage, with one percent of women and two percent of men.



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Data on self-employment shows relatively high overall rates which are falling for both men and women in the Republic of Korea (and both averaging close to 33%). Next highest are Indonesia—with women averaging 17.6% and men 20.5% – and Brazil, with women stable at 16.4% but men falling slightly at 24.6% from 27.4% in 2004. At the lower end are the EU, with self-employed women at 1.9% and men at 6.3%; the US, with 5.75 and 8.5, respectively (and falling slightly); and South Africa, with women at 11% and men at 8. The rate of self-employment for women is higher than men only in South Africa.

4. Access to Resources

Property ownership policies; land; bank loans

Percentage of women age 15-49

who have a bank or savings account of their own						
	Wealth Quintile					
	1st	2nd	3rd	4th	5th	Total
Education						
None	3.4	6.6	9.3	13.1	17.3	7.5
0-4 years	4.1	7.0	10.4	17.0	23.9	11.0
5-9 years	4.8	7.0	10.5	14.4	24.0	13.6
10-11 years	8.1	12.0	12.7	18.9	29.5	22.3
12+ years	16.7	18.2	20.7	26.6	47.3	40.9
Employment						
None	3.0	5.3	8.1	12.5	28.1	14.2
Cash	4.7	9.8	15.0	26.8	56.9	19.7
Non-cash	3.3	6.8	9.9	16.7	27.9	9.0
Total	3.7	7.1	10.5	16.3	33.6	15.1

Source: http://hetv.org/india/nfhs/index.html

Access and ownership to resources allows women to leverage investments, make decisions about allocation of resources, access credit and financing, and exercise personal decision making power. Currently there is a lack of data in this area. Most countries under study have policies in place which do not necessarily extend to practice. For example, in India women have had the right to own property and take out bank loans for many years, but often do not have the opportunity to exercise these rights. Overall, only 15% of women have bank accounts.



Access to mobile phones is important for entrepreneurship and market activities, e-banking. It also indicates autonomy of women, relating to issues of ownership vs. access to the technology. Cell phones are cheaper, more accessible, portable and use less energy than computers – as a result, mobile use should be more universal. Gender-based differences in access continue, including in the more developed countries. There is a lack of reliable, sex-disaggregated data for South Africa, India, and Indonesia.



Internet use is a key indicator of the knowledge society. Results show more males have internet access than females in every country collecting sex-disaggregated data. Isolated data exist for Brazil, India and South Africa, with internet use for both males and females remaining below 50%.



Little data exist on women's use of and access to infrastructure such as electricity and transportation, a base condition for STI. Electricity and clean and affordable energies allow women to engage in tasks other than obtaining energy for cooking and domestic chores; free up girls to attend school and have fewer detrimental health effects. It is an important precursor for enterprises and employment, for women as well as men: research on the effects of rural electrification on employment in South Africa, found increases in female employment within 5 years. Transportation issues involve travel to and from the workplace; security and freedom of movement; and ability to transport goods.



The percentage of female members of lower houses of parliament. South Africa shows by far the highest numbers, moving from one-third earlier in the last decade to almost one half by the end of the decade. Brazil is the lowest at 9.4 percent or less. All of the other countries show low numbers as well, from 11 to 18%. On the positive side, all are showing increases.





As seen here, of the countries under study, only Brazil, the US and the Republic of Korea consistently collect sex-disaggregated data in this area. This is unfortunate, as it is an important indicator – we know from isolated and anecdotal evidence that women are more highly represented at lower levels of government.



Little data is available globally on this important indicator of the role women play in leadership in the labour force. The particular employment issues that women face in terms of childcare, lower wages and less secure employment mean that this is a critical gap. In this study, data are available only from Brazil and South Africa.



The percentage of government ministers and sub-ministers that are female. South Africa again shows by far the highest ratios, with nearly half of ministerial and sub-ministerial positions held by women. The US did much better in appointed high-level positions than in elected ones, with one-third of cabinet-level positions held by women at the end of the decade. Brazil, India, and Korea remained almost entirely in the single digits. Indonesia showed improvement, with an increase from 5 to 15% over the decade.



Only the Republic of Korea collects data consistently, although the US provides data for two years. It shows the highest level of participation, with Korea dropping. South Africa comes in second highest at 33% with the EU, Brazil and Indonesia at 25% and below. India provides no data.



Although we have a fair amount of data on this item, there is a problem with comparability – countries vary between "any method", and "modern methods". These data do provide a general indication of women's access to contraception and hence their potential agency in choice and spacing of children.

6. **Opportunity and Capability**



Only Brazil and South Africa collect consolidated data on this indicator. Women have been the majority in South Africa through the decade, at 56% of students in 2001 rising to 60% in 2009. In Brazil female students made up nearly three times male students in distance education courses in 2000, and in 2009 14.5% of women were enrolled as compared to 9.1% of men.

Lifelong learning is an extremely important indicator of a learning society in the form of skills development, ongoing education, adult education, and e-learning. Internet and ICT access are a major vehicle. Very little data exist in general, and very little sexdisaggregated data. Brazil and Korea have the highest levels, with more females participating. In the EU, the sexes are tied.

2010

Knowledge Society Decision Making

Management participation

7.



At what rate do women participate in decision making in the knowledge society? To what extent are they able to exercise leadership? This data point indicates the representation of women includes (a) legislative officials and government administrators and (b) managers. In a few countries, the category of managers is divided into corporate and general managers. Brazil, India and the US have the highest rates of females in this category, almost equal with males at 42 and 45%. South Africa and EU follow at around 30%, with Indonesia below 25%, and the Republic of Korea at below 10%. Data are inconclusive.

University / research leadership



Little data is available on this indicator. Brazil reported 10.9% in 2009 and 13.8% in 2010 of public universities headed by a woman (although public universities represent only about 1/3 of Brazilian universities). The US shows 23% female college presidents in 2006, and South Africa shows 17% in 2011. No country/area showed data on female heads of research institutes.



Insufficient data are collected to analyse country trends, but one conclusion is clear. Women's participation on major corporate boards is very low in all the countries surveyed. Only the US (at 15-16%) and South Africa (14.5%) went beyond single digits in any year. The others are between 3.7 and 4.1%, except the Rebpulic of Korea, which comes in at barely 1%.



Timeframe India Female % European Union Female % United States Female % Republic of Korea Female %

2011

🛢 Brazil Female % 📒 South Africa Female % 📕 Indonesia Female %

An important indicator of who is recognized as a leader and eminent researcher in the national science community, and who sets the scientific agenda in a country. Academies also work with governments and universities to set policy and models for action. With the exception of South Africa (28%), female representation in science decision making is similar to that in the corporate sector: most academies see below 12% representation. Yearly data on this would be useful to understand whether there is progress.

8. Knowledge Economy



9. Science, Technology and Innovation Participation

Overall women account for a minority of the world's researchers. . . . Despite the growing demand for cross nationally comparable statistics on women in science, national data and their use in policymaking often remain limited (UNESO 2011). Substantial difficulties exist in comparing across countries without consistent data categorization and analysis.



Enrolment in all scientific, technological and engineering disciplines. With the exception of the US and EU, data in the study countries are not consistently collected by year or discipline. The data for India show high participation with the high ratio of women in dentistry, nursing, medicine, ayurvedic and Unani occupations. Brazil numbers appear to have dropped slightly overall, while representation of females is just under 50% in South Africa.

Engineering and physics enrollment



Includes computing sciences. When physics and engineering sciences are considered in isolation, participation rates drop by 30 points. Data for India includes engineering only, no physics.



PhDs in research institutes

Women account for the majority of tertiary students overall, however, men continue to dominate the highest levels as shown in the sparse data found here. In Indonesia, women comprised 18.4% in 2004 and 21.8% in 2006. The EU showed 32% females in 2006.



Moving to workforce participation, rates of participation drop in most countries by up to 30 points, indicating a substantial loss of females in the transition from education. In the US, tertiary enrolment rates are roughly equivalent to labour force participation. However, problems with advancement and retention for females mean numbers drop at the higher paid and decision making levels (Knowledge Economy / Knowledge Society Decision Making).

Biology, medical and life sciences enrollment



While data is sketchy and numbers difficult to break down, it appears that women's participation in the life sciences is much higher than in other areas of science, with a variation of 12 points.



Little sex-disaggregated data is available. In India in 2000 only 9.8% of researchers were women; by 2005 this had increased to 12.7%. South Africa showed 35.8% and 38% of researchers as female in 2003 and 2007, while the EU shows a consistent rate of 27-30%. We see a gradual upward trend.



Sex-disaggregated data are sparse for this indicator. India and the Republic of Korea are at 14 and 15.4% of refereed articles (the India figure is for life sciences only). In South Africa women produced 22% of scientific articles in 2000 and 25% each in years 2002-2005.



Understanding the sex, occupation and race breakdowns of national brain drain patterns can provide insight for policy and education. Data show a high rate for Brazil – females make up 56.6% of skilled emigrants in 2000 and 57.4% in 2010. In Indonesia rates were high from 2000 at 68.3%, through to 2007 when there was a big drop, to 24% in 2008. In Korea, 39.3% of this group are women, and in South Africa women make up 42.2% of professionals who emigrate. These trends indicate that in certain countries, more males than females will participate in "brain drain".

Entrepreneurship





Many females end up as technicians rather than researchers or in higher-level positions. In the universities they often do not advance to higher levels of decision making and tenure at the same rates as males. Indonesia and Brazil have the highest rates, at or just above 50%, with the US showing low numbers, and no data available for South Korea.

There is a particular lack of regular data on this. RICYT in LAC collects some, and the UN groups it with other work, making it harder to disaggregate for STI.



Business leadership



This is significant because a large percentage of new businesses are science and technology based, especially in the countries under study. The country/region with the highest level of participation by women is the EU at 33.8%, Indonesia follows at 19.8%, followed by Brazil (16.4%) and South Africa (8%), India and the US (7%). The Republic of Korea has dropped steadily from 2.1% in 2010 to 3.5% in 2009 and 5% in 2008. It should be noted that these data is misleading in part, since in many countries informal employment is generally a larger source of employment for women than formal sector activities.

Businesses of more than one person. Data show Indonesia at 29.4%, followed by Brazil at 28.5%, Korea at 21.7, EU (data only for 2000) at 17.2, and the US and India with 16 and 10.1% respectively. This is an area with room for substantive improvement in all countries.